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ONLINE: WPI

(54) Abstract Title
Nesting or stacking frame

(57) A modular support frame 10 with left and right side walls 13C, 13D and front and rear upright walls 13A, 13B which extend downwardly and outwardly, comprises slide grooves 14 having ridge portions 16 for slidable insertion into corresponding groove portions 14 of another frame for nesting (10, Fig. 4), and offsets 15 to support the bottom end of the other frame for stacking (10, Fig. 5), wherein a first pair of offsets 15 is provided inboard of a first pair of groove portions 14 on the front upright wall 13A, and a second pair of offsets 15 is located outboard of a second pair of groove portions 14 on the rear upright wall 13B. The transformation between nesting and stacking states is effected by turning the upper support frame through 180 degrees relative to the underlying frame. The support frame 10 may further include a plurality of transverse and longitudinal partitions 12 which define a plurality of accommodation spaces 11 for goods therein. Preferably, each of the walls 13A-D has an inverted U-shaped notch 100. A plurality of receptacles (20, Fig.6) may be provided, each with a netted bottom portion (20A, Fig. 6) and an annular flange (24, Fig. 6) which may project outwardly from an upper portion (20B, Fig. 6) thereof. Preferably, the frame is used for exhibiting items such as fruit or gifts.

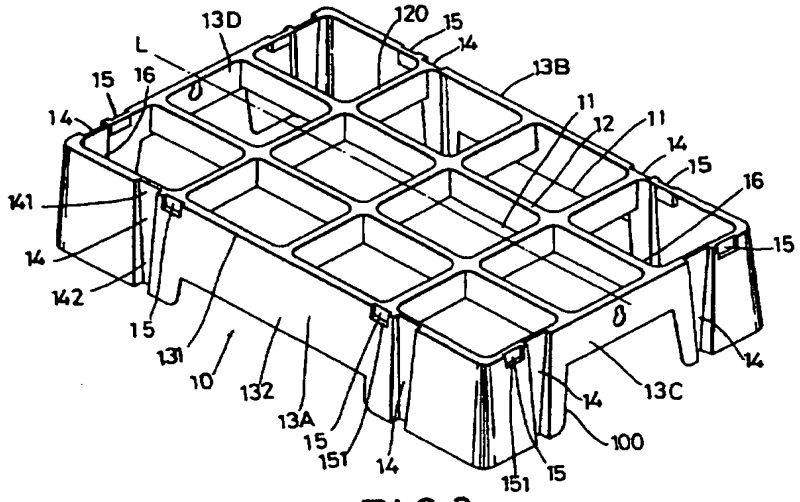

FIG.3

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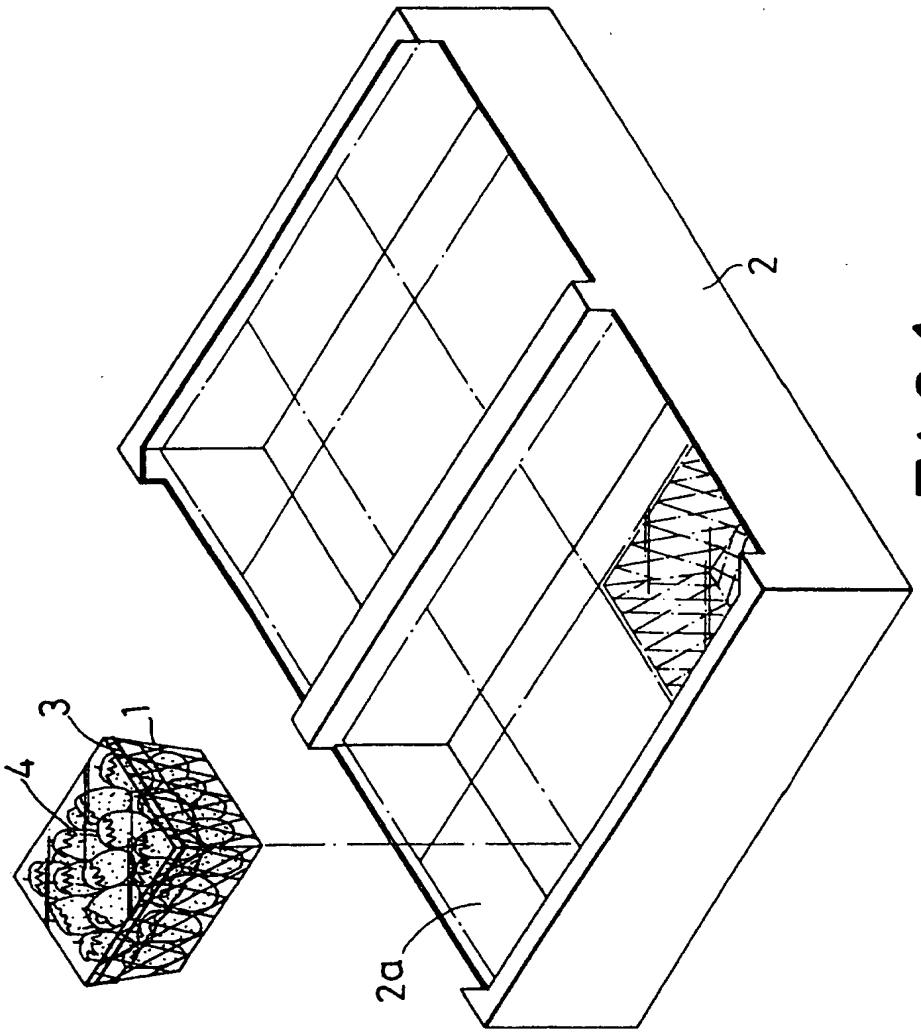

FIG.1
PRIOR ART

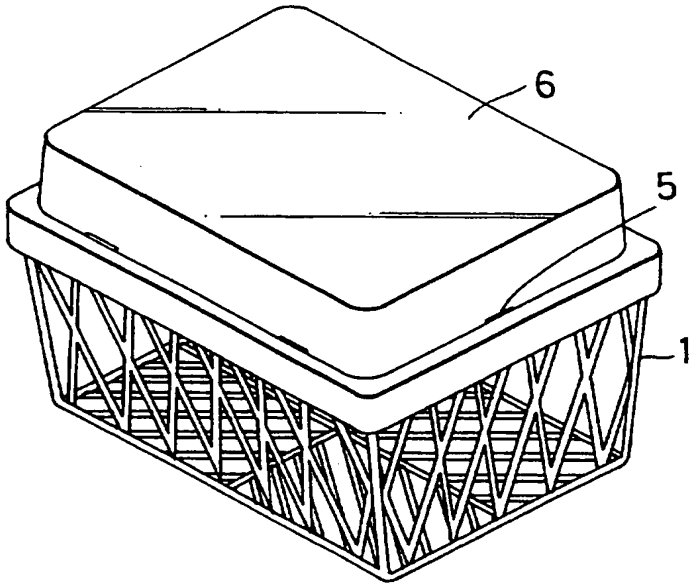

FIG. 2
PRIOR ART

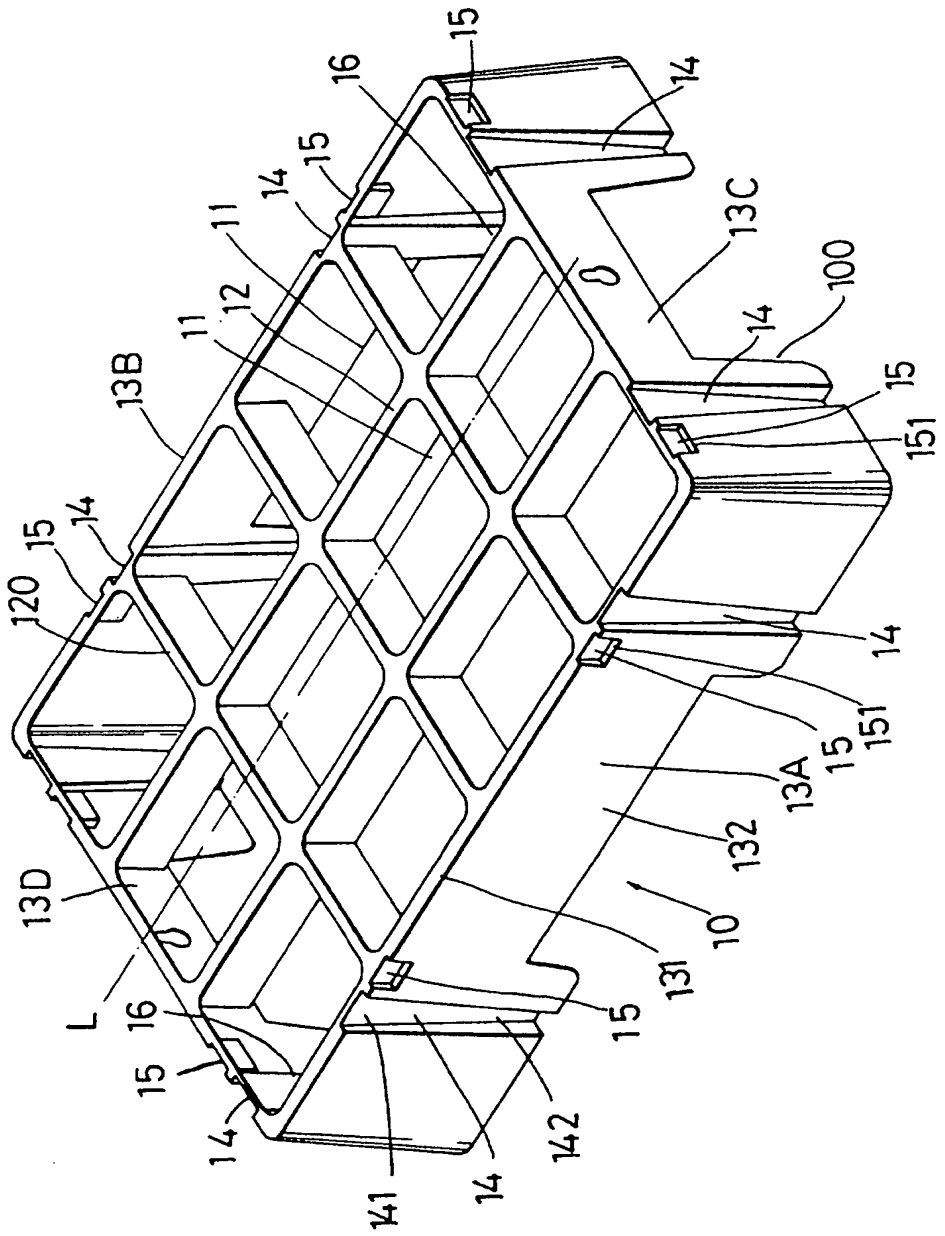
15
16
14
15
11
14
11
12
13B
15
14
120
13D
L
16
15
14
141
14
142
15
131
10
132
13A
15
151
14
15
151
13C
14
100
14

FIG.3

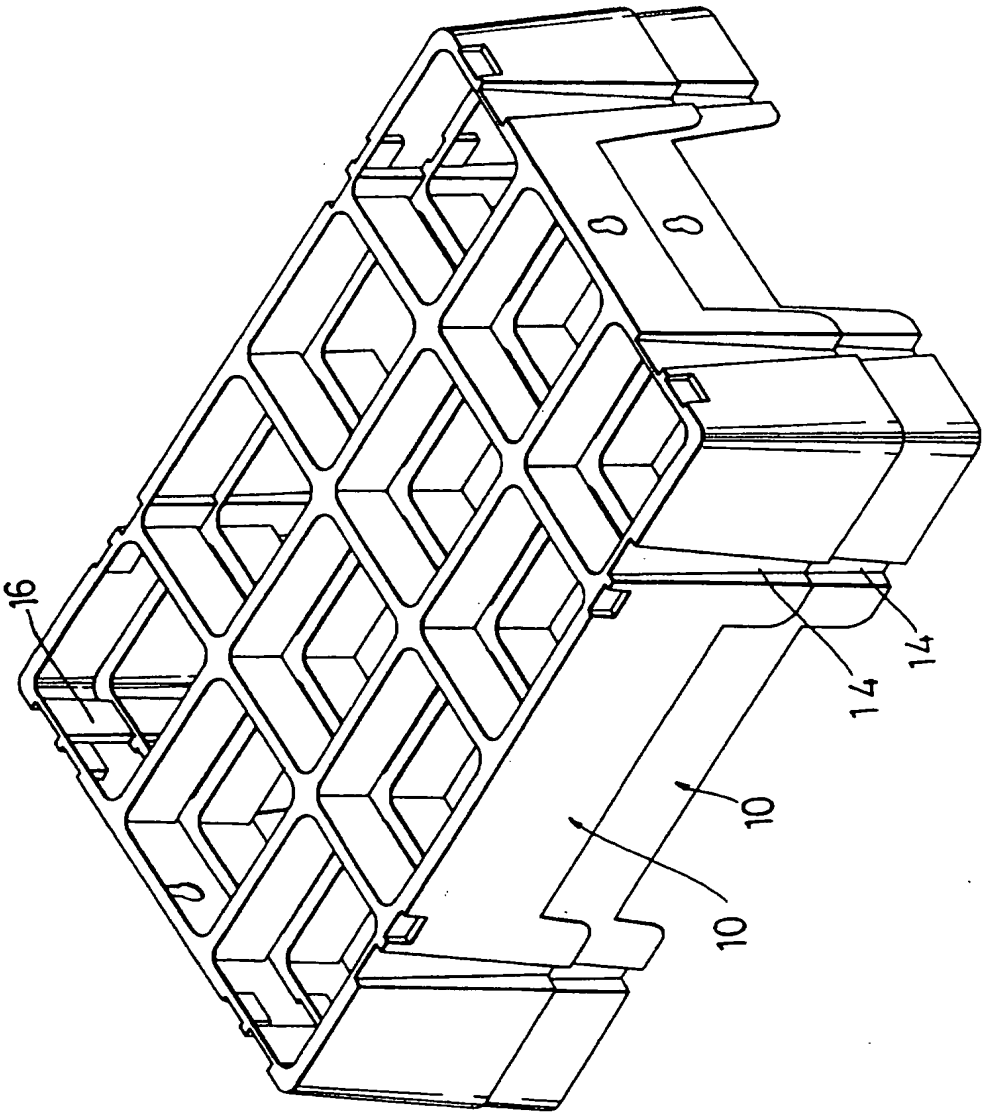

FIG. 4

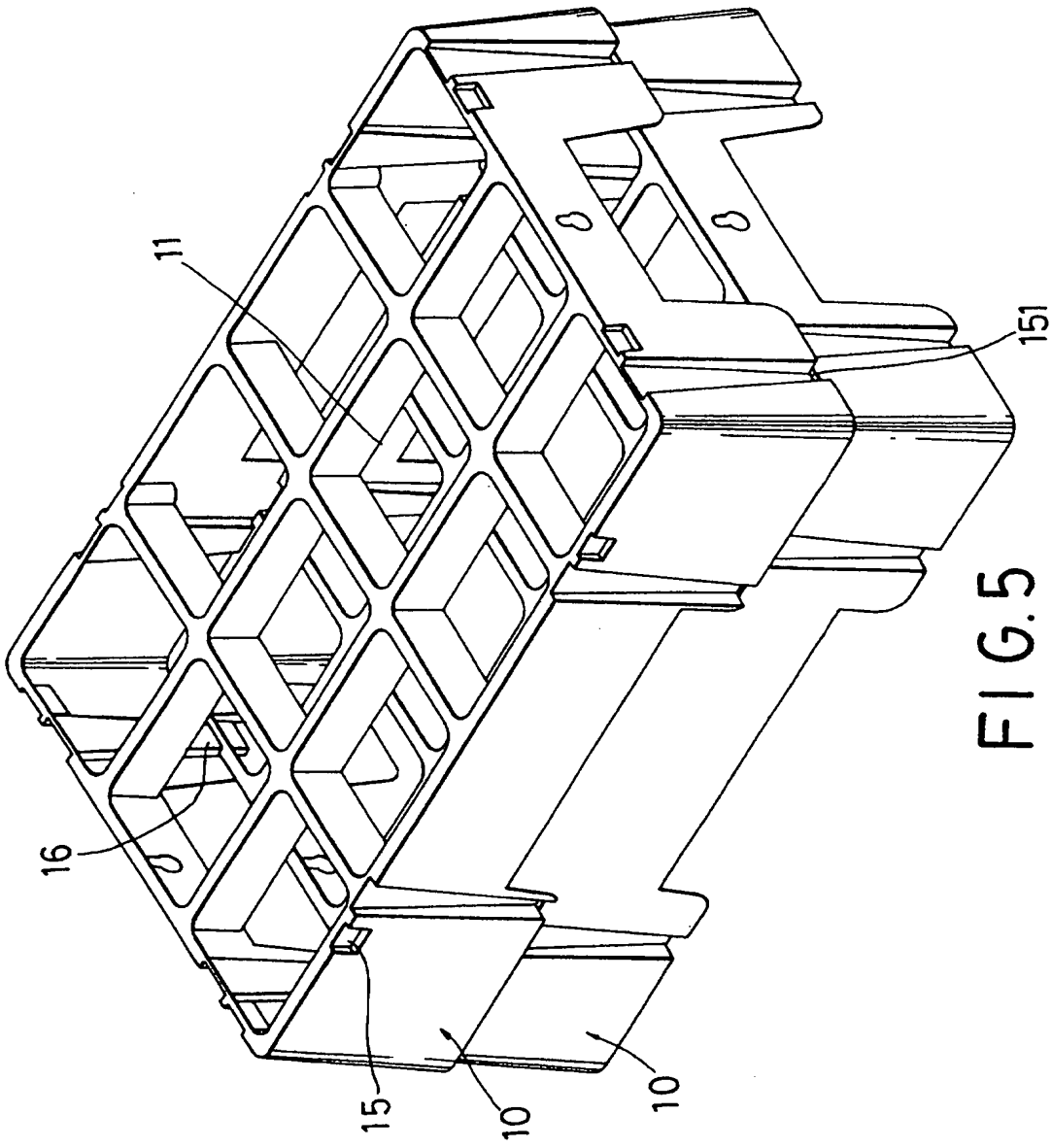

FIG.5

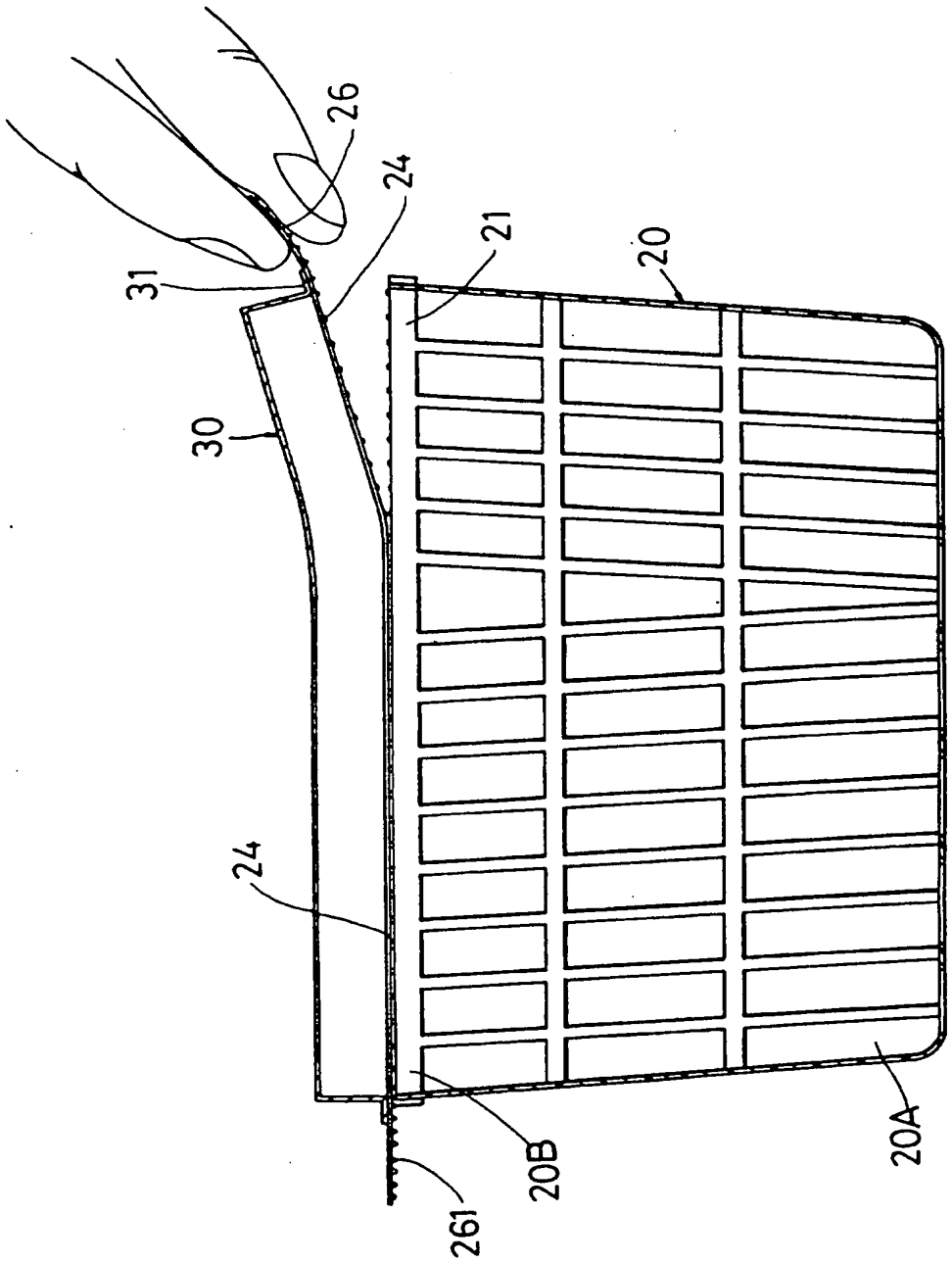

FIG.6

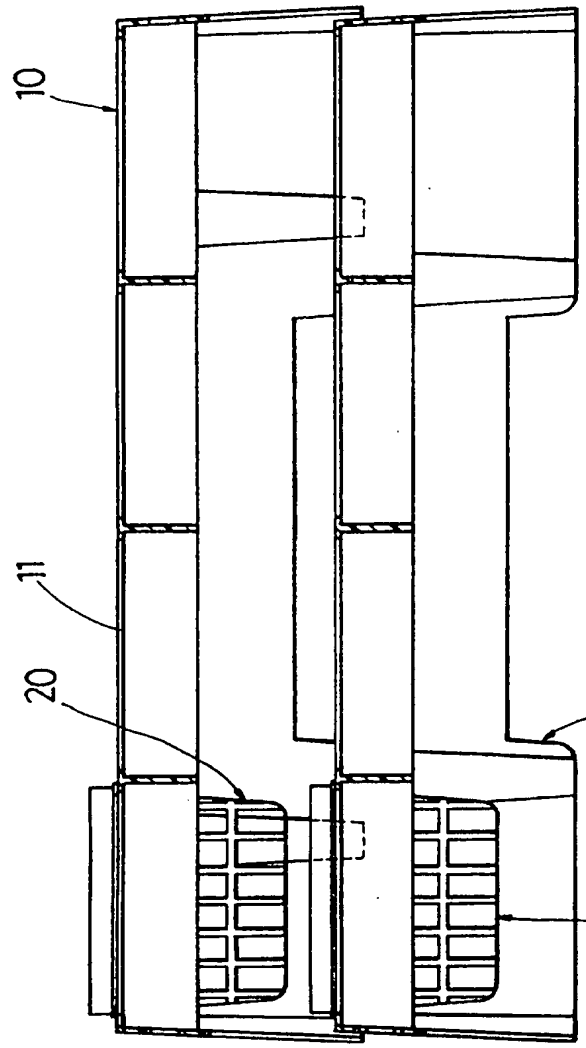

FIG.7

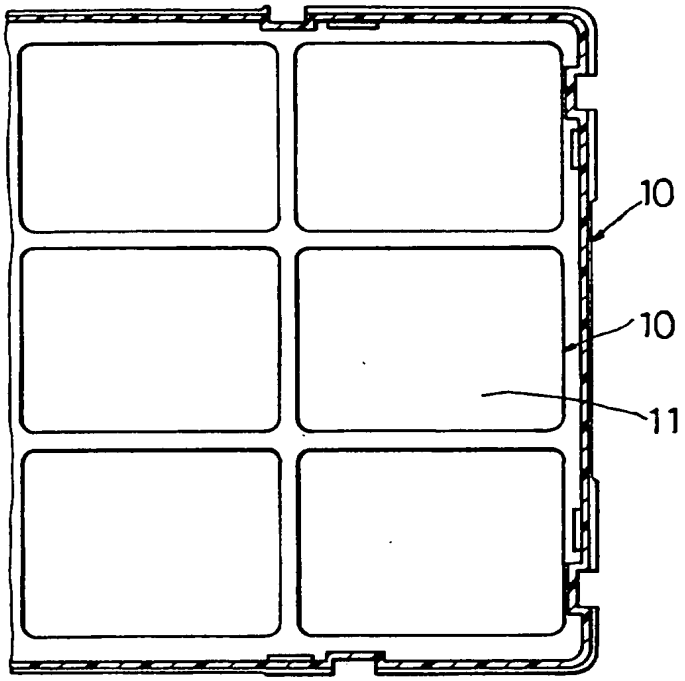

FIG.8

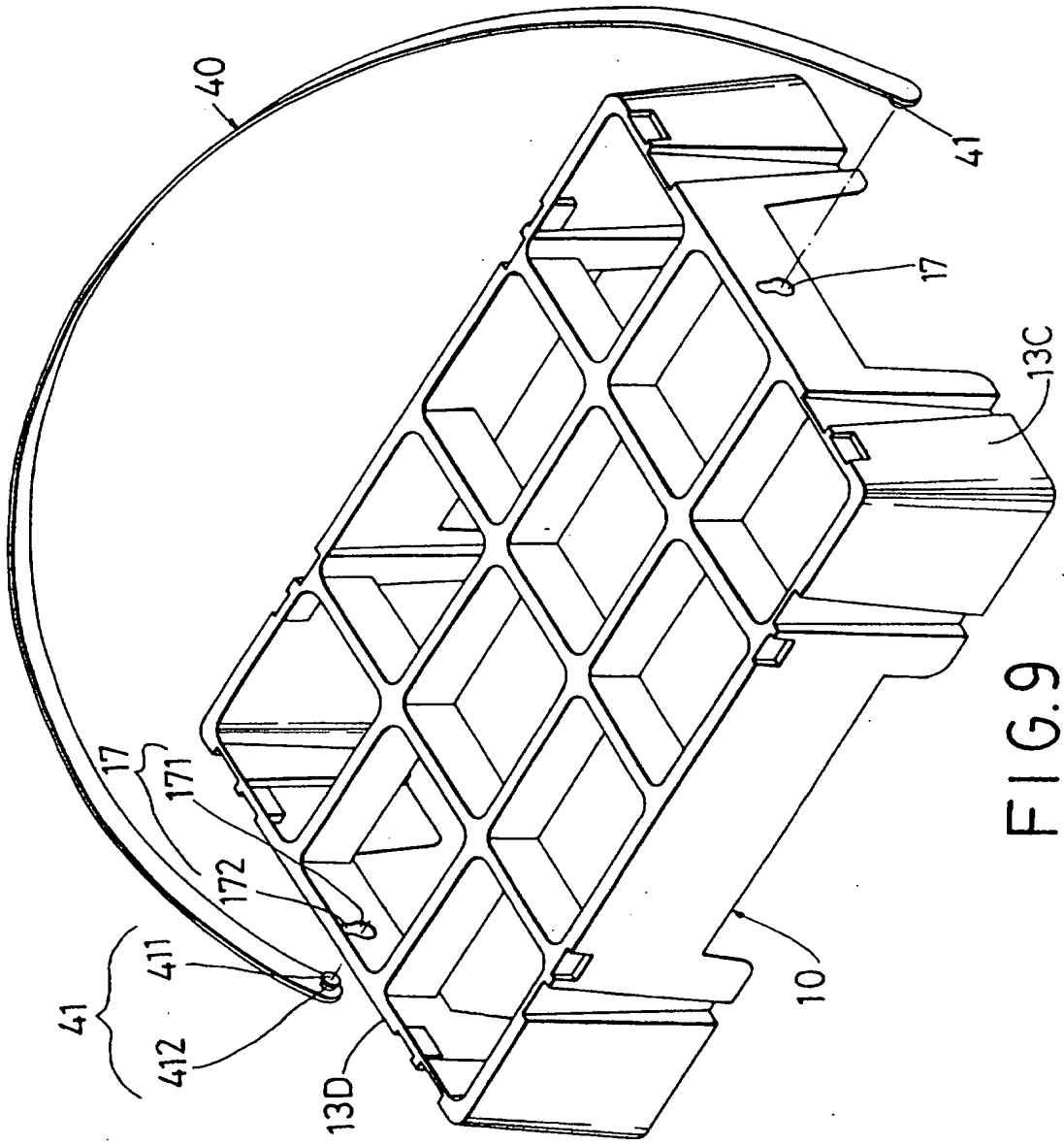

FIG.9

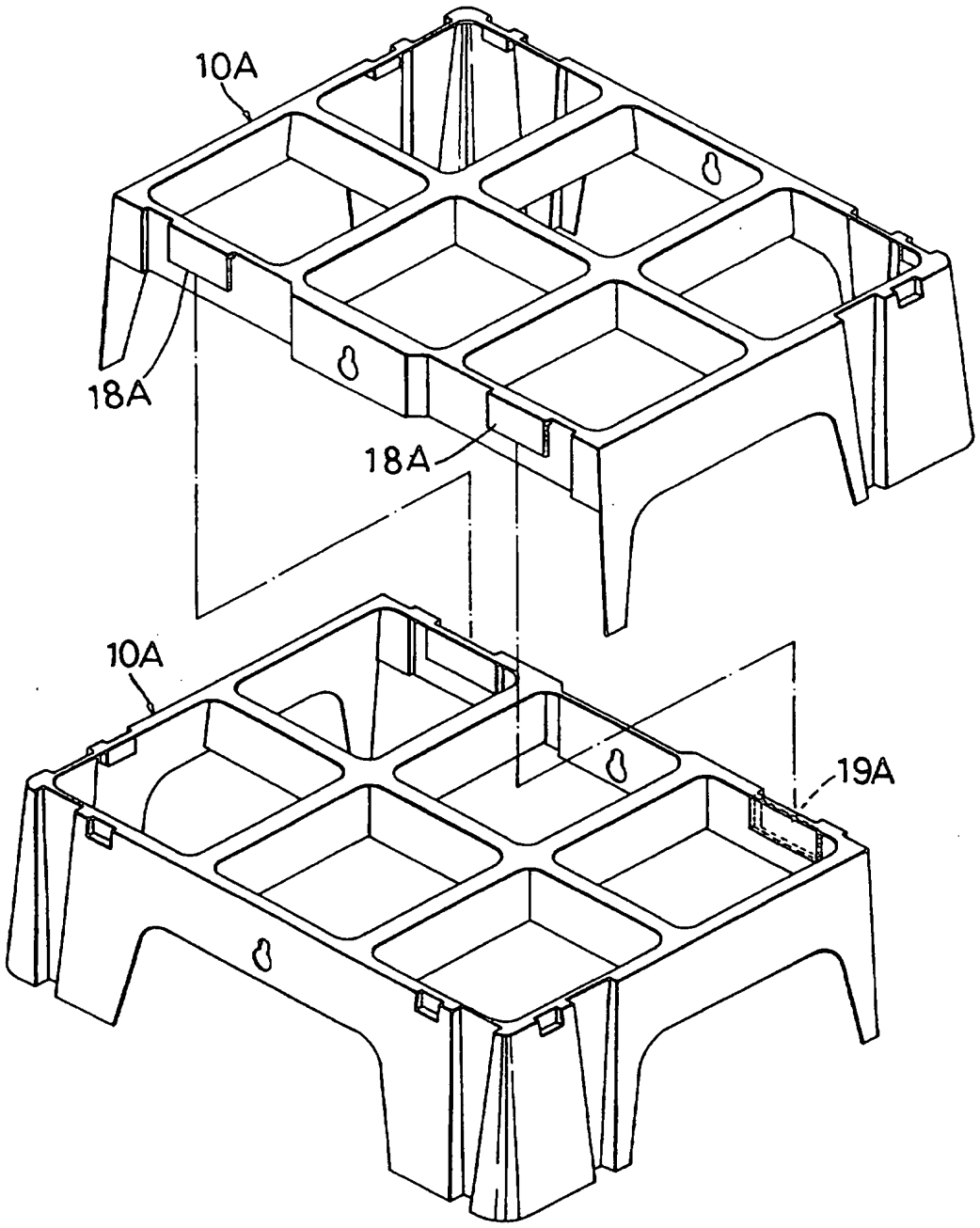

FIG.10

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Title: Modular Support Frame for Displaying Articles Therein

The invention relates to a modular support frame, more particularly to a modular support frame in which items, such as fruits and gifts, can be placed for exhibition purposes.

Referring to Figures 1 and 2, a conventional support frame used for exhibition of assorted items is shown to include a generally rectangular frame body 2 which defines two compartments 2a therein, and a plurality of receptacles 1. An assortment of fruits or gift items 4 can be disposed in the receptacles 1 after which, an equivalent number of covers 6 can be mounted on the receptacles 1 by the use of staple wires 5 prior to placing the receptacles 1 in the compartments 2a of the frame body 2.

One disadvantage which results from the use of the conventional support frame resides in that, when several support frames are stacked for storage, the support frames occupy a considerably large amount of storage space.

The object of this invention is to provide a modular support frame which can be stacked together so as to form a reduced profile for storage purposes.

Another object of this invention is to provide a plurality of modular support frames which can be stacked together in a different way so as to form a

non-reduced profile such that the stacked modular frames can be disposed for exhibition purposes.

Accordingly, the modular support frame of this invention includes a frame body which has a front upright wall and a rear upright wall disposed in symmetry with each other relative to a longitudinal axis; and a right side wall and a left side wall respectively transverse to the front and rear upright walls and in symmetry with each other relative to a transverse axis which intersects the longitudinal axis. Each of the front and rear upright walls has an upper wall portion and a lower wall portion which extends downwardly and outwardly from the upper wall portion to form a downwardly inclined outer surface thereof. Each of the front and rear upright walls includes a pair of slide grooves disposed in symmetry with each other relative to the transverse axis. Each of the slide grooves extends from the upper wall portion down to the lower wall portion and includes an upper groove portion and a lower groove portion. The lower groove portion is indented inwardly to form a ridge portion that protrudes from an inner surface of the lower wall portion. The ridge portion has a support bottom end disposed inwardly of the outer surface, and is of a dimension for slidable insertion into the upper groove portion of another modular support frame when the modular support frame is stacked over the latter to

form a reduced profile of an unused state.

Each of the front and rear upright walls further includes a pair of offsets disposed in symmetry with each other relative to the transverse axis, and in proximity to an upper edge of the upper wall portion. Each of the offsets includes a horizontal seat portion to support the support bottom end when the modular support frame is stacked over another modular support frame to form a non-reduced profile of a used state.

The offsets of the front upright wall are disposed respectively inboard to the pair of upper groove portions of the front upright wall while the offsets of the rear upright wall are disposed respectively outboard of the pair of upper groove portions of the rear upright wall. The pairs of offsets of the front upright wall and the pairs of upper groove portions of the rear upright walls are respectively positioned in lines parallel to the transverse axis.

The transformation of the stacked modular support frames from the unused state to the used state can be effected by simply turning an upper support frame 180 degrees relative to an underlying lower support frame.

Other features and advantages of this invention will become apparent in the following detailed description of the preferred embodiments of this invention, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a conventional support frame which is used generally for displaying gifts therein;

Figure 2 is an enlarged view of a receptacle used in combination with the conventional support frame for holding an assortment of gifts;

Figure 3 is a perspective view of a modular support frame according to this invention, the frame being used generally for displaying gifts therein;

Figure 4 illustrates how a plurality of modular support frames of this invention are stacked for storage;

Figure 5 illustrates how a plurality of modular support frames of this invention are stacked for displaying items therein;

Figure 6 shows a receptacle used in combination with the modular support frame of this invention;

Figures 7 and 8 respectively are side and top views of the stacked modular support frames in a display state;

Figure 9 shows the modular support frame of this invention together with a handle member for carrying or removal of the modular support frame from another support frame; and

Figure 10 shows a modified modular support frame of this invention.

Before the present invention is described in greater detail, it should be noted that same reference numerals have been used to denote like elements throughout the disclosure.

Referring to Figure 3, the preferred embodiment of a modular support frame 10 according to this invention includes a frame body which has a front upright wall 13A and a rear upright wall 13B disposed in symmetry with each other relative to an imaginary longitudinal axis L, and a left side wall 13C and a right side wall 13D respectively transverse to the front and rear upright walls 13A, 13B and in symmetry with each other relative to a transverse axis which intersects the longitudinal axis L.

As illustrated, each of the front and rear upright walls 13A, 13B has an upper wall portion 131 and a lower wall portion 132 which extends downwardly and outwardly from the upper wall portion 131 to form a downwardly inclined outer surface thereof. Each of the front and rear upright walls 13A, 13B includes a pair of slide grooves 14 disposed in symmetry with each other relative to the transverse axis. Each of the slide grooves 14 extends from the upper wall portion 131 to the lower wall portion 132 and has an upper groove portion 141 and a lower groove portion 142. The lower portion 142 is indented inwardly of the frame body 10 to form a ridge portion 16 that protrudes from

an inner surface thereof.

Each of the front and rear upright walls 13A, 13B further includes a pair of offsets 15 disposed in symmetry with each other relative to the transverse axis, and in proximity to the upper edge of the upper wall portion 131. Each of the offsets 15 has a horizontal seat portion 151.

Note that the ridge portion 16 has a support bottom end thereof disposed inwardly of the outer surface of the upright wall 13A, 13B and is of a dimension for slidable insertion into the upper groove portion 141 of another support frame 10. Another aspect to note is that the offsets 15 of the front upright wall 13A are disposed respectively inboard to the corresponding upper groove portions 141 thereof and are therefore located between the corresponding slide grooves 14 of the front upright wall 13A. The offsets 15 of the rear upright wall 13B are disposed 1respectively outboard of the corresponding upper groove portions 141 thereof. Thus, the slide grooves 14 of the rear upright wall 13B are located between the offsets 15 on the same wall. The offsets 15 of the front upright wall 13A and the upper groove portions 141 of the rear upright wall 13B are positioned on four lines which are parallel to the transverse axis. In other words, the offsets 15 in the front upright wall 13A are aligned with the upper groove portions 141 of

the rear upright wall 13B, and vice versa. The formation of the offsets 15 in this embodiment can alternatively be defined as follows: The modular support frame 10 can be divided imaginarily into two sets of half wall bodies by a diagonal line thereof. Under this condition, the pair of offsets 15 in the first half wall body are disposed respectively ahead of the corresponding slide grooves 14 in the clockwise direction while the pair of offsets 15 in the second half wall body are disposed respectively ahead of the corresponding slide grooves 14 in the counterclockwise direction.

The left and right side walls 13C, 13D have the same structure as that of the front and rear upright walls 13A, 13B except that the left and right side walls 13C, 13D are shorter than the front and rear upright walls 13A, 13B. The frame body 10 further includes a plurality of longitudinal partitions 12 which extend between the left side wall 13C and the right side wall 13D and which are parallel to the longitudinal axis L, and a plurality of transverse partitions 120 which extend between the front upright wall 13A and the rear upright wall 13B and which are parallel to the transverse axis so as to dissect the longitudinal partitions 12 respectively, thereby defining a plurality of accommodation spaces 11 for the disposal of an assortment of goods therein.

Each of the front and rear upright walls 13A, 13B and each of the left and right side walls 13C, 13D has an inverted U-shaped notch 100 and is laterally formed and spaced from level of the lower edge through which the accommodation spaces 11 are in communication with the exterior of the frame body 10.

As illustrated in Figure 4, for storage and at an unused state, the support frames 10 can be stacked such that the lower section of the upper support frame 10 overlaps partially the upper section of the lower support frame 10, wherein the support bottom ends of the ridge portions 16 of the upper support frame 10 (see Figure 3) extend into the upper groove portion 141 in the slide grooves 14 of the lower support frame 10, thereby forming a reduced profile to occupy a smaller storage space.

Referring to Figure 5, the transformation from the unused state to the used state can be effected by simply turning the upper modular support frame 10 180 degrees relative to and prior to the disposal thereof on the underlying lower support frame 10. Under this condition, the support bottom ends of the ridge portions 16 of the upper support frame 10 are supported by the horizontal seat portion 151 of the offsets 15 of the lower support frame 10. Thus, when the modular support frames 10 of this invention are at the used state, a non-reduced profile is formed such that an

assortment of goods can be disposed in the accommodation spaces 11 for exhibition purposes.

Referring to Figure 6, the modular support frame according to this invention further includes a plurality of receptacles 20 (only one is shown). Each of the receptacles 20 includes a netted bottom portion 20A and an annular flange 24 which projects outwardly from an upper portion 20B thereof so as to be supported respectively by the upper edges of the front and rear upright walls 13A, 13B, the left and right side walls 13C, 13D and the partitions 12, 120 of the frame body 10 (see Figure 3). Note that each of the receptacles 20 has a depth that is smaller than the length difference between the slide groove 14 and the offset 15 (see Figure 3). Each of the receptacles 20 is made of plastic and further includes two opposed tabs 26 that project outwardly from the annular flange 24 to assist in lifting of the receptacle 20 from a respective one of the accommodation spaces 11 (see Figure 3), and a plastic cover 30 which is heat-sealed to the annular flange 24, thereby covering the upper portion thereof in such a manner that a seal 31 is formed between the cover 30 and the flange 24. As illustrated, the seal 31 can be pulled to facilitate removal of the cover 30 from the annular flange 24 of the receptacle 20. The tabs 26 are formed with lower beads 261 to prevent slipperiness thereof.

Figures 7 and 8 are side and top views of the stacked modular support frames 10, wherein the receptacles 20 are disposed in the accommodation spaces 11 to exhibit goods, such as gift items or fruits, therein.

Referring to Figure 9, to facilitate removal of the stacked modular support frames 10 in the unused state from one another, the left and right side walls 13C, 13D thereof are provided with engagement holes 17 respectively. Each of the holes 17 includes an enlarged lower section 171 and a narrower upper section 172 in communication with the lower section 171. The enlarged heads 411 of hooks 41 of a handle member 40 can be inserted through the lower sections 171 of the holes 17 so that the shanks 412 of the hooks 41 can be engaged within the upper sections 172 of the holes 17 during a lifting operation.

Referring to Figure 10, a modified modular support frame is shown to include two half wall bodies 10A, 10B which cooperate to form a frame body and which respectively have the same structure as the first embodiment except that one of the half wall bodies 10A, 10B is provided with a pair of L-shaped hooks 18A on a lateral side wall thereof while the other one of the half wall bodies 10A, 10B is formed with two recesses 19A for receiving the hooks 18 when the half wall bodies 10A, 10B are stacked. The features and objects

are the same as the first embodiment.

CLAIMS:

1. A modular support frame capable of being stacked one over the other, comprising:

a first frame body including a first front upright wall and a first rear upright wall disposed in symmetry with each other relative to a first longitudinal axis; and a first right side wall and a first left side wall respectively transverse to the first front and first rear upright walls and in symmetry with each other relative to a first transverse axis which intersects the first longitudinal axis,

each of the first front upright wall and the first rear upright wall having a first upper wall portion and a first lower wall portion extending downwardly and outwardly from the first upper wall portion to form a downwardly inclined first outer surface thereof and including:

a pair of first slide grooves disposed in symmetry with each other relative to the first transverse axis, the first slide groove extending from the first upper wall portion to the first lower wall portion and having a first upper groove portion and a first lower groove portion, the first lower groove portion being indented inwardly of the frame body to form a first ridge portion protruding from the inner surface of the first lower wall portion, the first ridge portion having a first support bottom end

disposed inwardly of the first outer surface, and being of a dimension for slidable insertion into the first upper groove portion of another modular support frame when the modular support frame is stacked over the other modular support frame to form a reduced profile of an unused state; and

a pair of first offsets disposed in symmetry with each other relative to the first transverse axis, and in proximity to the upper edge of the first upper wall portion, each of the first offsets including a first horizontal seat portion to support the first support bottom end when the modular support frame is stacked over the other modular support frame to form a non-reduced profile of a used state,

wherein the pair of first offsets of the first front upright wall are disposed respectively inboard to the pair of first upper groove portions of the first front upright wall, the pair of first offsets of the rear upright wall being disposed respectively outboard of the pair of first upper groove portions of the first rear upright wall, the pairs of first offsets of the first front upright wall and the pairs of first upper groove portions of the first rear upright walls being respectively positioned on lines parallel to the transverse axis,

whereby transformation of the stacked modular support frames from the unused state to the used state

can be effected by turning the upper support frame 180 degrees relative to the underlying lower support frame.

2. The modular support frame according to Claim 1, wherein the frame body further includes a plurality of longitudinal partitions which extend between the first left side wall and the first right side wall and which are parallel to the first longitudinal axis, and a plurality of transverse partitions which extend between the first front upright wall and the first rear upright wall and which are parallel to the transverse axis so as to dissect the longitudinal partitions respectively, thereby defining a plurality of accommodation spaces for disposal of an assortment of goods therein.

3. The modular support frame according to Claim 2, wherein each of the first front and rear upright walls and each of the first left and right side walls has an inverted U-shaped notch and is laterally formed and spaced from level of a lower edge thereof via which the accommodation spaces are in communication with an exterior of the frame body.

4. The modular support frame according to Claim 2, further including a plurality of receptacles, each of which includes a netted bottom portion and an annular flange projecting outwardly from an upper portion thereof so as to be supported respectively by the upper edges of the front and rear upright walls and the left and right side walls and the partitions, each of the

receptacles having a depth smaller than length difference between the slide groove and the offset.

5. A support frame capable of being stacked one over the other, comprising:

a second frame body including a second front upright wall and a second rear upright wall disposed in symmetry with each other relative to a second longitudinal axis, and a second right side wall and a second left side wall respectively transverse to the second front and second right upright walls and in symmetry with each other relative to a second transverse axis which intersects the second longitudinal axis,

each of the second front upright wall and the second rear upright wall having a third upper wall portion and a third lower wall portion extending downwardly and outwardly from the third upper wall portion to form a downwardly inclined third outer surface thereof, each of the second right side wall and the second left side wall having a fourth upper wall portion and a fourth lower wall portion extending downwardly and outwardly from the fourth upper wall portion to form a downwardly inclined fourth outer surface thereof;

the second front upright wall and the second right side wall forming a first half wall body, the second rear upright wall and the second left side wall forming

a second half wall body, each of the first and second half wall bodies including:

a pair of third slide grooves respectively disposed in the corresponding second upright wall and the corresponding second side wall and in symmetry with the other pair of third slide grooves in the other half wall body relative to a diagonal line which dissects the second frame body into the first and second half wall bodies, the pair of third slide grooves respectively extending from the third and the fourth upper wall portions to the third and the fourth lower wall portions and respectively having a third and a fourth upper groove portions and a third and a fourth lower groove portion;the third and the fourth lower groove portions being respectively indented inwardly of the wall bodies to form a third and a fourth ridge portion protruding from the inner surface of the third and the fourth lower wall portions respectively, the third and the fourth ridge portions respectively having a third and a fourth support bottom end disposed inwardly of the third and the fourth outer surfaces respectively, and being of dimensions for slidable insertion into the third and the fourth upper groove portion of another modular support frame when the modular support frame is stacked over the other modular support frame to form a reduced profile of an unused state; and

a pair of third offsets disposed respectively in the corresponding second upright wall and the corresponding second side wall and in symmetry with the other pair of third offsets in the other half wall body relative to the diagonal, and in proximity to the upper edges of the third and the fourth upper wall portions respectively,

each of the third offsets including a third horizontal seat portion to support the corresponding support bottom ends when the modular support frame is stacked over the other modular support frame to form a non-reduced profile of a used state,

wherein the pair of offsets of the first half wall body are disposed respectively ahead in a clockwise direction of the third and the fourth upper groove portions of the first half wall body, the pair of offsets of the second half wall body being disposed respectively ahead in a counter-clockwise direction of the third and the fourth upper groove portions of the second half wall body,

whereby, transformation of the stacked modular support frames from the unused state to the used state can be effected by turning the upper support frame 180 degrees relative to the underlying lower support frame.

6. The support frame substantially as described hereinbefore with reference to and as illustrated in Figures 3 to 9 of the accompanying drawings.

The Patent Office

Application No:	GB 9701454.2	**Examiner:**	Dr. Paul R. Minton
Claims searched:	1-6	**Date of search:**	8 April 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): B8H (HKK, HLB, HLX); B8P (PN, PS, PU).

Int Cl (Ed.6): B65D 21/04.

Other: ONLINE: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
A	GB 1 536 151	(DRG). See particularly Figures 1 & 3.	1
A	GB 0 986 877	(SHELL). See particularly Figures 1-3.	1
A	US 3 682 351	(WARNER). See particularly Figures 3 & 4.	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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